ASBESTOS DUMP SITE 37064

U.S ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE "REMEDIAL INVESTIGATION REPORT, ASBESTOS DUMP SITES, MORRIS COUNTY, NEW JERSEY, NOVEMBER 18, 1987" PREPARED BY FRED C. HART, ASSOCIATES

INTRODUCTION

The USEPA has conducted an evaluation of the Remedial Investigation Report for the Asbestos Disposal Sites in Morris County, New Jersey. This work is in accordance with the Administrative Order of April 4, 1985 with National Gypsum Company. The criteria for this evaluation were governed by the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) (40 CFR Part 300.68) and by EPA's Guidance on Remedial Investigations Under CERCLA. The Remedial Investigations and supporting documents were reviewed and evaluated to determine if the criteria for a remedial investigation were considered and satisfied during the site investigation and document preparation.

This review includes an evaluation matrix summarizing the extent to which the NCP criteria have been satisfied. The matrix includes both the criteria for compliance with NCP and the EPA's Guidance on Remedial Investigations Under CERCLA. The matrix addresses the criteria for a Remedial Investigation by major categories as described in the aforementioned documents.

A narrative summary of the evaluation matrix is also included in the report. This summary follows the matrix and provides details for each evaluation criteria category. The summary also identifies portions of the report requiring clarification and/or further information in order to produce a site characterization in accordance with NCP criteria. Recommendations for addressing the noted deficiencies are provided in the last section of this document.

Results of the split sample analyses done by Ebasco Services have been presented in tabular form and compared to the sample analyses done by Fred C. Hart, Associates. These split sample analyses serve as a method of analysis verification and provide a basis for the comparison of the analytical results.

SUMMARY

This review of the Asbestos Disposal Sites Remedial Investigation (RI) Document has been prepared by EPA in accordance with the requirements of Administrative Order (Index Number: II-CERCLA-50103) on consent issued by the EPA on April 4, 1985.

EPA has conducted an evaluation of the RI document and supporting references to determine whether the criteria as established by the National Oil and Hazardous Substance Pollution and Contingency Plan (NCP) (40 CFR Part 300.68) and EPA's Guidance on Remedial Investigations Under CERCLA have been implemented during the RI phase. In addition, EPA reviewed the document to determine if good engineering practices and judgements had been implemented during the RI phase.

Several areas of deficiencies have been noted as a result of the RI document review. The review found several criteria as delineated in the NCP, deficient or completely absent from the RI. Also, certain aspects of the sampling techniques, geological and hydrogeological assumptions used in the report, data evaluation and site characterization were considered to be inadequate.

The RI report did not fully satisfy certain categories in the NCP because of lack of sufficient detail or because there was no discussion at all. These categories include receptors potentially at risk; site characterization; hazardous substance migration control; climate; ability to maintain a remedy and other categories delineated in the matrix. A more detailed discussion of the NCP criteria is presented in the section following the matrix.

The review also revealed that the air sampling techniques and locations did not always render an adequate characterization at or the extent of airborne asbestos contamination present at the site. For example, the air sample volumes were in some cases insufficient to yield reliable results. On the basis of these and other deficiencies, it is our opinion that additional characterization of the concentration and distribution of asbestos is necessary before the air pathway for off-site receptors is discounted (as being insignificant) as was done in this report. EPA recommends that Hart follow the air sampling techniques described in the NIOSH Method 7400 and sample when the asbestos mound is dry. EPA also recommends that samples be taken in close proximity to the asbestos piles.

Regarding the geology and hydrogeology discussions in the report, our review revealed several areas of concern. First, the slug tests that were conducted at each of the four sites were used as a basis for groundwater characterization. There are several lithologic units at each site and many of the wells are screened in several of these units. It is not clear from the discussion whether the values for hydraulic conductivity represent one unit or several. Furthermore, the characteristics of the water bearing units are not adequately discussed.

Also, the report refers to previous studies which state that a confining layer of clay is present under the sites. However, this information has not been substantiated. This is a critical point since the report characterizes the risk of groundwater contamination through the aquifers as remote and therefore recommends no further investigation of this pathway. EPA does not find this approach to be acceptable because of the possibility of downgradient users of groundwater. The dismissal of this problem is based on unproven assumptions.

Data evaluation was also one area in which further investigation is required. The remedial investigation report explains that several unexpected or unexplainable compounds were found in samples and trip and field blanks. Therefore, the data from these samples were not considered. It is not clear if the data was rejected by data validation procedures or rejected by unsubstantiated assumptions. This results in data gaps and resampling of these points may be necessary.

It is our findings that site characterizations were not completely defined. The report does not quantify the soil or groundwater contamination. It seems apparent that remediation has only been intended for the asbestos mound on the Millington site. It should be noted that asbestos is not the only contaminant of concern. There is also heavy metal contamination present in the soil and groundwater at some of the sites. The distribution of heavy metal contaminants should be investigated and quantitied.

Our review found that the conclusions stated in Section 7.0 of the report were deficient for concluding this RI. The report states that problems exist with uncovered asbestos at all four sites, groundwater contamination, and surface water contamination. However, the report does not specifically determine potential response actions or provide bench-scale treatability studies to support these potential response actions. These activities should be conducted during the RI phase as outlined in the EPA's Guidance Document.

REMEDIAL INVESTIGATION (RI) EVALUATION MATRIX

This section contains the evaluation matrix developed to provide a checklist by which a comparison can be made between the information provided in the RI and the requirements of the USEPA Guidance on Remedial Investigation.

The matrix contains five column headings which show: 1) NCP Criteria Reference, 2) if the existing information satisfied applicable criteria, 3) if the information is presented but not considered complete, 4) if information is not provided, and 5) the Fred C. Hart, Associates documentation source.

This matrix is supplemented with a separate text section which contains an expanded evaluation of the degree of completeness of the information in Fred C. Hart reports. The matrix should be reviewed in conjunction with this text section.

Based on the matrix developed to evaluate the RI, NCP criteria were satisfied in only three areas: substance types, contribution of contamination and wetlands proximity. The remaining criteria were not completely satisfied or not addressed. The criteria which were included but not complete are the following: receptors potentially at risk; likely pathways of exposure; potential public health effects; likelihood of future releases; source characterization; substance containment; hazardous properties of contaminants present; concentration and distribution of contaminants present; environmental fate and transport; adequacy of containment; extent of current and potential migration; and soil and groundwater characterization. Those NCP criteria which were not addressed include welfare concerns; surface water characterization; drainage patterns; flood potential and frequencies; and climate conditions; likely quantities present; possibility of reuse/recycling and ability to maintain remedy.

ASBESTOS DISPOSAL SITE
REMEDIAL INVESTIGATION EVALUATION MATRIX
NATIONAL CONTINGENCY PLAN, 40 CFR 300.68

Criteria	NCP Criteria 40 CFR 300.68	Criteria Satisfied	Included but not complete	Not Included	RI Report Reference
1. REMEDIAL INVESTIGATION					
A. Public Health and The Environment Concerns Associated with Existing Site Conditions	(e)(2)(i)				
1. Receptors potentially at risk	(e)(2)(i)		x		Sections 6.2.2.2; 6.3.2.2; 6.4.2.2; 6.5.2.2
a. Humans					
b. Plants					
c. Animals					Section 3.12
d. Threatened, endangered, or rare species					
e. Groundwater					
(1) Residential, municipal, industrial wells					Sections 3.10; 3.11
(2) Potential ground water use					
f. Surface water					Section 3.9
2. Likely pathways of exposure at site	(e)(2)(ii)		x		
a. Ingestion					
b. Skin contact					Section 6.2.2.2; 6.3.2.2; 6.4.2.2; 6.5.2.2
(1) Bathing					
(2) Recreation					
c. Inhalation					
3. Potential public health effects	(e)(2)(i)		x		
4. Contribution of contamination to	(e)(2)(xiv)	x			
a. Air					Section 5.5
b. Land					Section 5.7
c. Water					Section 5.6; 5.8
d. Food Chain					

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NATIONAL CONTINGENCY PLAN, 40 CFR 300.68

Criteria	NCP Criteria 40 CFR 300.68	Criteria Satisfied	Included but not complete	Not Included	RI Report Reference
5. Welfare concerns	(e)(2)(i)			x	
6. Likelihood of future release if hazardous substances remain onsite	(e)(2)(ix)		x		
B. Hazardous Substances Present	(e)(2)(iii)				Sections 6.2.1; 6.3.1; 6.4.1; 6.5.1
1. Extent to which source was adequately identified and characterized	(e)(2)(vii)		x		
2. Substance type	(e)(2)(iii)	x			
3. Substance containment	(e)(2)(x)		x		
4. Hazardous properties of chemical substances	(e)(2)(iii)		x		Sections 6.2.1; 6.3.1; 6.4.1; 6.5.1
a. Toxicity (1) Acute (2) Chronic b. Persistence c. Radioactivity d. Solubility e. Volatility f. Density g. Ignitability h. Reactivity i. Corrosivity j. Compatability					
5. Quantities present	(e)(2)(iii)			x	Sections 6.2.1.2; 6.3.1.2; 6.4.1.2; 6.5.1.2

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NATIONAL CONTINGENCY PLAN, 40 CFR 300.68

Criteria	NCP Criteria 40 CFR 300.68	Criteria Satisfied	Included but not complete	Not Included	RI Report Reference
6. Concentration and distribution present			x		Sections 6.2.1.2; 6.3.1.2; 6.4.1.2 6.5.1.2
a. Air					
c. Surface Water					
d. Soil					
e. Biota					
(1) Flora					
(2) Fauna					
7. Environmental fate and transport			x		
a. Bioaccumulation					
b. Physical-chemical degradation					
c. Adsorption					
C. Hazardous Substance Migration Potential	(e)(2)(xi)				Sections 6.2.1; 6.3.1; 6.4.1; 6.5.1
1. Adequacy of containment	(e)(2)(x)		x		
a. Natural barriers					
b. Man-made barriers					
2. Extent of current migration	(e)(2)(xi)		x		
a. Subsurface soil and ground water environment					
b. Surface water, sediment, and surficial soil					
c. Atmospheric or biotic migration, as appropriate					
3. Extent of potential migration	(e)(i)(xi)		x		Sections 6.2.2; 6.3.2; 6.4.2; 6.5.2
a. Subsurface soil and ground water					
b. Surface water, sediment, and soil					
c. Atmospheric and biotic migration					

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NATIONAL CONTINGENCY PLAN, 40 CFR 300.68

Criteria	NCP Criteria 40 CFR 300.68	Criteria Satisfied	Included but not complete	Not Included	RI Report Reference
D. Hydrogeological Factors	(e)(2)(iv)				Sections 4.2; 4.3
1. Soil characterization			x		
a. Permeability					
b. Fracturing (patterns)					
2. Ground water characterization			x		Section 4.3
a. Quantities					
b. Depth to saturated zone					
c. Flow rates & directions					
d. Hydrologic gradient					
e. Quality					
f. Upper & lower aquifer that may be affected					
3. Surface water characterization				x	
a. Quantities					
b. Flow rates and direction					
c. Quality					
d. Classification					
e. Uses					
4. Drainage patterns				x	
5. Flood potential and frequencies				x	
6. Wetlands proximity		x			
E. Climate	(e)(2)(vi)				
1. Evaporation/Precipitation				x	
a. Annual total rainfall					
b. 24-hr. max. rainfall/year					
2. Temperature				x	

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NATIONAL CONTINGENCY PLAN, 40 CFR 300.68

Criteria	NCP Criteria 40 CFR 300.68	Criteria Satisfied	Included but not complete	Not Included	RI Report Reference
F. Possibility of Reuse/Recycling	(e)(2)(viii)			x	
1. Practicality					
2. Cost effectiveness					
G. Compliance with Governmental Requirements	(e)(2)(xii)				Sections 6.2.4; 6.3.4; 6.4.4; 6.5.4
1. Applicability of federal requirements, criteria, advisories			x		
2. Applicability of state requirements, criteria, advisories			x		
3. Existing and potential exceedance of applicable requirement, criteria, advisories	(e)(2)(xiii)		x		
H. Ability to maintain Remedy	(e)(2)(xv)			x	
I. Site Background Information			x		Section 2.0

EVALUATION MATRIX DISCUSSION

This evaluation matrix summary contains a general discussion of each subheading of the matrix. Each summary is referenced (by heading) to the corresponding section of the matrix. The summary information includes and expanded evaluation of the degree of completeness of the RI.

Remedial Investigation

A. Public Health

A.1 Receptors Potentially at Risk

Although the endangerment assessment included in the RI report does provide some relevant information regarding receptors potentially at risk, several important issues were overlooked or not examined in sufficient detail. These insufficiencies are outlined below.

1) In the report summary (p. 7-2), F.C. Hart concludes that although "uncovered asbestos at all four locations poses a risk through direct contact... airborne asbestos does not pose a risk." This conclusion is based on results of air sampling conducted at the site, which indicated that asbestos air concentrations, when detected, were less than the TLV (0.5 fibers/cc for amosite amphibole asbestos). However, due to unrepresentative sampling conditions and analytical limitations (see Section B.6 for further discussion), the true nature and extent of asbestos contamination at the site may not have been adequately characterized. Therefore, the conclusion that airborne asbestos poses no public health threat is premature.

2) In general, the discussion of potential human receptors included in the RI is adequate. However, additional information is necessary to assess human exposure potential in the Passaic River downstream of the Millington site. Although Hart considers various potential pathways (e.g., direct contact and fish ingestion) associated with the river, the likelihood of exposure is not examined in sufficient detail. The extent to which the Passaic River is utilizd for recreational purposes (swimming, fishing) should be discussed.

3) Although a survey of aquatic flora and fauna was undertaken as part of the remedial investigation, no attempt was made to survey terrestrial plants and animals and describe how these organisms would be impacted by contaminants present at the site. The latter information would be particularly useful in characterizing the Great Swamp site which comprises portions of the Great Swamp National Wildlife Refuge.

4) The characterization of current groundwater use included in the RI report satisfies NCP criteria. Hart personnel conducted a door-to-door survey of residences in the vicinity of Great Swamp, White Bridge Road, and New Vernon sites to determine the presence of domestic wells. Ten potable well samples were collected and analyzed as a result of this survey. However, Hart neglected to examine the potential for future groundwater use, an area which should be addressed according to NCP criteria.

A.2 Likely Pathways of Exposure

For each site (Millington and the three satellite sites), Hart presents a matrix of potential exposure pathways. The key pathways of concern are addressed. These pathways include inhalation, ingestion, and direct contact. However, the discussion of the association between these pathways and their relevant exposure points included in the RI is incomplete. For example, for the Millington site, direct contact and ingestion are considered as potential pathways only in relation to the site itself. Because residences lie in close proximity to the east and south of the site, and because the wind flow is generally in a west-east direction, individuals could come into contact (e.g., children playing outdoors) with asbestos contaminated soil or contaminated dust inside their homes. Therefore, the ingestion and direct contact pathways should be linked with off-site as well as on-site exposure points.

A.3 Potential Public Health Effects

A discussion of potential acute and chronic health effects related to exposure to contaminants of concern is not included in the RI.

A.4 Contribution of Contamination

The discussion of the site's contribution to air, land, and water is included in the RI in accordance with NCP criteria. Although, food chain contamination was not addressed, this matter at the site (asbestos and nickel) are not likely to bioaccumulate.

A.5 Welfare Concerns

The impacts of contamination from the Asbestos Dump Site on neighboring land, area property values, and on-site workers are not addressed in the RI report.

A.6 Likelihood of Future Releases

The likelihood of future releases if hazardous substances remain on-site is insufficiently addressed in the RI report. A more thorough intergration of data relative to contaminants present at the site and their relative mobility is necessary to satisfy this criterion. In addition, the implications of weather extremes (e.g., floods, extreme winds) should have been discussed.

B. Hazardous Substances Present

B.1 Source Identification and Characterization

Although the RI report did include a fairly extensive site characterization and source identification, several factors were overlooked. First, additional information is necessary regarding the location of the exposed asbestos piles and, in particular, the geographic relationship between the exposed mounds and the areas where test boring and air monitoring activities were conducted.

Second, the source of heavy metal contamination present at selected site areas should be discussed more extensively. Cadmium and nickel concentrations in surface water exceeding relevant water quality criteria were detected immediately downstream, but not upstream, of the Millington site. A discussion of possible sources of these contaminants should have been included in the RI.

The data collected shows that cadmium is a prevalent contaminant in the water and soil media, and the data is basically consistent in magnitude for the various sites. However, one surface water sample adjacent to the Millington Site has an indicated cadmium concentration that is over an order of magnitude greater than any other waterbone cadmium concentration reported. Either this sample is inaccurate or there is another, undetected/undiscussed source of cadmium in the river water. The inconsistency is important since it is this value that is used (appropriately as a conservative value) to compare environmental monitoring/potential release concentrations for cadmium against appropriate limits. In the RI analysis it is concluded that the cadmium is the contaminant that is most likely to exceed its corresponding limits.

B.2 Substance Types

The substance types present at the site are adequately addressed in the RI.

B.3 Substance Containment

More information is necessary to assess the degree to which contaminants present at the site are contained, either by natural or man-made barriers. The following questions should be addressed: What, if any, measures are implemented to prevent wind dispersal of loose asbestos fibers? For example, at the White Bridge Road site, is there any type containment that would prevent and/or minimize exposure to those who frequent the stables (horseback riding would tend to stir up the soil and fibers, increasing the likelihood of exposure)? The type and extent of vegetative cover should also be addressed, chips and fibers.

B.4 Hazardous Properties of Chemical Substances

The discussion of the toxicity, persistence, and other physical-chemical characteristics of the contaminants present at the site is not sufficiently addressed. The toxicities of a number primary site containments (e.g., asbestos;, cadmium, and nickel) were not discussed because Hart claimed that "toxicity data was not available or was incomplete" for these constituents. However, the literature base associated with these contaminants is extensive.

Although indicator chemicals were chosen according to methods outlined in the Superfund Public Health Evaluation Manual (USEPA), 1986), the endangerment assessment should have included a more thorough discussion of their toxicological properties. At a minimum, a discussion of the pathway-specific acute and chronic toxicity of asbestos should have been addressed.

B.5 Quantities Present

The RI report does not include any discussion of the estimated quantities of contaminated soil, groundwater or asbestos fill or mounds. It was stated that remediation of the asbestos mound at the Millington site was the only action that was needed at these sites. Therefore, the need for quantities of contaminated soils and groundwater was not required for this RI. (It should be noted that quantities of materials or amount of surface areas of the asbestos mounds has not been included in the report.) However, the conclusion in the RI states that remedial action is not necessary at all the sites has not been substantiated, in EPA's opinion. Therefore, the quantities of contaminated materials is required. The volumes of contaminated materials is a key factor in dertermining cost-effective remedial actions.

B.6 Concentration and Distribution Present

The characterization of the concentration and distrubution of contaminants present at the site is lacking in a number of areas. These deficiencies are outlined below.

1) As suggested earlier (Section A.1), the conclusion that airborne asbestos poses no public health threat is probably premature due to inadequate characterization of asbestos contamination at the site. During the subsurface investigations ambient air samples were collected and analyzed for asbestos fiber concentrations. The subsurface investigations consisted of soil borings, well installations, and test pit operations, all of which might potentially create airbourne asbestos fibers by disturbing the asbestos-containing soils. In order to make any valid and reliable determination concerning the concentration and distribution of contaminants from a particular source, two issues are critical: 1) monitoring/sampling must be conducted in areas (i.e., in the area where the source is most prevalent and exposed) and under conditions (e.g., weather) most relevant to a risk assessment; and 2) the sampling methodology implemented should ensure that concentrations which might pose a public health hazard would be detected. The assessment of asbestos concentrations failed to satisfy the above criteria. The major problems with the characterization are discussed in relation to the individual sites.

Millington

Fred C. Hart stated that it had rained two to three days prior to drilling of the test borings and that the wind speed was essentially zero during the test pit excavation. These conditions can hardly be considered as "medium case" scenarios, for the dampening of the loose fibers (resulting from the previous rain) coupled with the still wind conditions could have significantly reduced atmospheric transport. According to the RI report, the Millington site contains the largest volume of landfilled asbestos waste products of all four sites. The asbestos waste mound, located in the western sector of the site, is composed solely of loose fibers and is approximately 300 feet long, 95 feet wide, and 26-30 feet thick. Given that this mound lies in close proximity to residences (which border this site to the east) and other potential receptors, it is imperative that sampling conditions are representative of typical site conditions, which does not appear to be the case collected during test pit excavations to substantiate your conclusions, claiming that the 0.2978 fibers/cc detected during these sampling episodes is below the TLV (0.5 fibers/cc). The small sample volumes (35-80L) collected during these excavations, however, are

probably not sufficient to make such a determination. In addition, the sample pump and methods used during your ambient air monitoring are intended for indoor sampling (e.g., to determine occupational exposure conditions); it is not clear whether this method is applicable for outdoor sampling.

Great Swamp Site

As with the other sites, asbestos air samples were collected during the test borings drilled as part of the Remedial Investigation. However, at the Great Swamp site, no sampling was conducted in the area of the largest and most concentrated source of potential contamination. In your discussion of the Great Swamp site (Section 6.3, p.6-59), you acknowledged that "loose asbestos fibers are present at the surface of the disposal pit, but no ambient air samples were taken and no borings were drilled within the actual disposal area." The failure to sample in this area may be unimportant, as the Great Swamp is remote and typically very damp. Therefore, your assertion that exposure (via inhalation or dermal contact) would be limited is probably reasonable. Nevertheless, the characterization of the concentration and distribution of airborne asbestos contamination at this site is inadequate and exemplifies the lack of attention paid to air sampling design and methodology, which are critical to an asseessment of a site of this nature.

In summary, the available data are not sufficient to support the conclusions drawn in the RI regarding the contribution and distribution of asbestos to airborne contamination. Therefore, exposure to asbestos via the air pathway should not be discounted (as insignificant) in the final analysis.

2) Although a discussion of the concentration and distribution of contaminants in surface water is included in the RI, your interpretation of some of these data is invalid. For example, three surface water samples taken, were not sufficient to adequately characterize the Millington site. These samples were obtained in the following areas: 1) immediately upstream of the site; 2) immediately downstream of the site; and 3) 10 miles downstream of the site at the Commonwealth Water Company intake. High

levels of cadmium (563 ppb) and nickel (47 ppb) exceeding water quality criteria were detected in the sample immediately downstream (SW-1) of the site. These metals were not detected, however, in any of the upstream samples (SW-2 and SW-3). Although the farthermost downstream surface water sample did contain nickel, it did not contain cadmium. You acknowledged the presence of high cadmium levels in the one sample, but attempted to diminish the significance of the finding by asserting that cadmium was not detected in any of the groundwater samples and was only detected in one out of three surface water samples. This conclusion is misleading because the downstream results are not distinguished from the upstream results. The fact that the sample point upstream of the site contained significant concentrations of cadmium is important and should not be overlooked because of an invalid comparison. Surface water concentrations of asbestos were averaged to determine the representative concentration at the site. The corresponding values for the upgradient samples were 300,000 fibers/l and 200,000 fibers/l, respectively. However, the downgradient sample contained 3,200,000 fibers/liter. Nevertheless, these values were averaged to yield a "representative" site concentration. Again, such handling of data is misleading; upgradient and downgradient sample results should be used to identify trends, not lumped to determine a mean (average) contaminant concentration.

3) The concentration and distribution of contaminants present in indigenous flora and fauna is not addressed in the RI.

4) Tables 1 through 4 in this report (see Appendix A) list the comparison of Ebasco's split sample analytical results and F.C. Hart's analytical results. It should be noted that all of the samples split with Ebasco were analyzed in the Contractor Laboratory Program (CLP). The parameter for the CLP and F.C. Hart determinations that differ most strongly; and consistently, is asbestos. For example, comparative analysis of sample results for NVR-3 (a groundwater monitoring well at the New Vernon Road site) yield the following: The CLP determined a concentration of 3700 fibers/cc where as F.C. Hart reported a concentration of 100 fibers/cc. The CLP determined a

concentration of 30,000 fibers/cc in monitoring well GS3 (Great Swamp Site); F.C. Hart reported a concentration of 120 fibers/cc for the same location. At monitoring well GS5 (also Great Swamp), the CLP determined a concentration of 27,000 fibers/cc; you reported 100 fibers/cc. The magnitude of these differences is significant; therfore, the source of the discrepancy should be examined in greater detail. These differences can be explained in part by variations in counting techniques and observation abilities among counters, or perhaps to differences in the microscopes used for analysis. However, it is unlikely that a 270-fold difference can be attributed solely to the latter factors.

Other parameters for which significant differences were noted include tetrachloroethene, trichlorofluoramethane, PAHs, and Zinc. For example, results of the CLP analyses indicated that surface water sample SW-10 contained 160 ppb; again, Hart reported this parameter as being undetected. The CLP detected 217 ppb trichlorofluoromethane in SWP-3 (Great Swamp surface water sample), whereas Hart reported 96 ppb. For one sediment sample, the CLP detected 531 ppm total PAHs; Hart reported less than half that amount-231 ppm. Zinc concentration determinations also differed: the CLP detected 148 ppb in SWP-5, whereas Hart reported only 3.6 ppm.

Solid drum sample ananlytical results are not tabulated in Appendix A because the results presented by Hart could not be compared with CLP determinations. Whereas Hart presented composite data, the CLP provided drum-specific results. The raw data (included in Hart Appendix H) supporting Hart's composite presentation could also not be compared with CLP results because it was impossible to determine the test pit and drum number which corresponded with each laboratory ID. Although quantitative comparisons could not be made, the primary drum constituents determined by Hart (methylene chloride, toluene, trichlorofluoromethane, chlorobenzene, and trichloroethene) agree with CLP determinations.

Trip and field blank split sample results are also not presented in Appendix A because of sample identification differences. However, for those samples which could be compared, no significant differences between CLP and Hart results were observed.

B.7 Environmental Fate and Transport

Hart's discussion of the environmental fate of contaminants present at the site should be augmented to include information relating to the ultimate fate and behavior of asbestos fibers when redistributed in air or in surface water. This information is not included in the RI.

C. Hazardous Substance Migration Potential

C.1 Adequacy of Containment

The adequacy of hazardous substance containment has not been adequately addressed in the RI. See Section B.3 of this review for a delineation of the major deficiencies.

C.2 Extent of Current Migration

The description of the extent of current contaminant migration presented in the RI is limited in several respects. First, any conclusion regarding the migration of site contaminants is limited by the sample design and number. No off-site samples were collected for the Asbestos Dump Site, which limits the predictive capabilities of the investigation. Also, as discussed earlier, the surface water data collected for the Millington site do not render a meaningful characterization of heavy metal migration because only two downstream points are considered; one immediately downstream and one ten miles downstream at the Commonwealth Water Company intake. Downstream samples obtained from locations (in between the two aforementioned locations) closer to relevant exposure points would have been more useful. Second, although data are presented which describe contaminant distributions at individual sample locations, these results are not assimilated to identify possible migration trends.

C.3 Extent of Potential Migration

The extent of potential migration of on-site contaminants is not sufficiently addressed in the RI. This is particularly true for the principal contaminant, asbestos. Because asbestos is very resisitant to thermal and chemical degradation, it persists in the environment and can be widely redistributed by both natural forces and human means. The extent to which asbestos fibers could potentially migrate in the environment is governed by a complex set of factors which include rates of air and water flow, fiber diameters, agglomeration of particles and other factors which were not discussed in the RI.

D. Hydrogeological Factors

D.1 Soil Characterization

Permeability (slug) tests were conducted at several monitoring wells and the results are given in the report. There are several lithologic units present at each site, however, there is no discussion of varying permeabilities among these units.

D.2 Groundwater Characterization

There are several inconsistencies in the hydrogeologic discussions of the sites as described below.

In the discussion of the hydrogeology at the Millington Site, it is stated that the uppermost aquifer is found within the silt/clay unit overlying the bedrock and calculations of hydraulic conductivity and seepage velocity are given for this unit only. The slug test data indicate a slightly higher hydraulic conductivity in Well 903, which is screened in both the asbestos and the silt/clay unit, than in 905 and 907, which are screened only in the silt/clay unit. It is likely that the hydraulic conductivity and the porosity are higher in the asbestos fill and this would alter the calculated seepage velocities for the site.

Similarly asbestos fill is not discussed as part of the water bearing unit for the Great Swamp Site A. It is stated that the aquifer consists of swamp muck. The methodology used for calculating hydraulic conductivity is not clear from the discussion; however, it appears that the hydraulic conductivity are an average for the site and represent the varying lithologies and not just the swamp muck. The report should clarify whether slug tests were performed in wells screened in one unit only or several.

In the discussion of Great Swamp Site B, it is stated that the upper water-bearing unit consists of silty sand. Again, the methodology for calculating hydraulic conductivity is not clear from the discussion, however, it appears that the values for hydraulic conductivity were calculated using slug test data from wells that were screened in both the silty sand unit and the underlying clay. This, of course, would result in lower calculated seepage velocities than actually exists.

The hydrogeologic discussio.. of the New Vernon Road Site is confusing in that the water-bearing unit is stated to be swamp muck but swamp muck does not appear on the cross-section for the site as it did on the Great Swamp Site A cross-section. The discussion of hydraulic conductivity values does, however, acknowledge that the range in values is due to varying lithologies found within the screened intervals.

The potential for lower aquifers to be affected by contamination at the Great Swamp and satellite sites is ruled out on the basis of a paper (Miller, 1965) referenced in the RI which states that there is a regional confining unit, 60 feet thick, within the stratified drift deposits of the Great swamp. The data collected for the RI, particularly the slug test data, do not support the existence of a significant confining unit. Furthermore the depth at which this unit occurs is not mentioned.

D.3 Surface Water Characterization

The site specific surface water descriptions including quantity, flow rates, direction, quality, classification and uses have not been included in this report as required by the NCP criteria.

D.4 Drainage Patterns

Drainage patterns have not been specifically described for each site. Surface run-off has briefly been described in terms of a transport mechanism for a surface water exposure pathway.

D.5 Flood potential and frequencies

This topic has not been addressed in the report as required in the NCP. This discussion would be especially useful for the Great Swamp Site since the site is located within a marsh land as indicated on the site maps included in the RI report.

D.6 Wetlands Proximity

The report adequately describes the proximity of the site to wetlands areas.

E. Climate

E.1 Evaporation/Precipitation

This information has not been included in the report as

required by the NCP.

E.2 Temperature

This information has not been included in the report as required by the NCP.

F. Possibility of Reuse/Recycling

A discussion of reuse/recycling of the wastes present at these sites has not been included in the report. An analysis outlining the practicality and cost-effectiveness of waste recovery, reuse and recycling should be performed.

G. Compliance with Governmental Requirements

The RI report identifies most of the applicable and appropriate requirements for cleanup levels for groundwater. However, the report references criteria that are not always the lowest allowable concentration. For example, on page 3-111, the report states that the value for asbestos levels in the groundwater were below detection limit (100,000 fibers/liter). It should be noted that the Clean Water Act, Water Quality Criteria states that the maximum concentration of asbestos should be 30,000 fiber/liter.

With regard to soil, the RI report states that no criteria exist for hazardous substance list chemicals. This statement is true, however, New Jersey has specified cleanup levels for eleven metals, PCB's, petroleum, hydrocarbons and total volatile organics in soils (i.e. BISE).

H. Ability to Maintain a Remedy

The report does not discuss the long-term maintenance requirements or the responsible parties ability to maintain a remedy as required by the NCP.

I. Site Background Information

The report does include a discussion of site background information. However, in certain instances, no attempt has been made to verify or check the data used from previously written reports. For example, the geology data from a previous report could have been checked with the data taken from the field investigation done for this report to determine the continuity of the confining layer. The geological data is critical information for determining the effects of contamination of lower aquifers.

RECOMMENDATIONS FOR ADDRESSING DEFICIENCIES

In reviewing the report, EPA has noted several areas of deficiences. The Remedial Investigation was found lacking in several of the criteria as required by the National Oil and Hazardous Substances Pollution Contingency Plan, EPA Guidance on Remedial Investigations and good engineering judgement and practice. These areas of deficiences and recommendations for improvements are summarized below.

A. It is our recommendation that the NCP criteria and the Guidance on Remedial Investigations Under CERCLA document be reviewed and the RI revised to satisfy the criteria. The RI should address the criteria and comply with the guidance outlined in these documents. The matrix provided in this report summarizes the criteria that need additional or new information.

B. According to the EPA guidance document, the site characterization is the focal point of the RI. It is evident from our review, a clear understanding of the extent of site contamination has not been presented. The RI report states that problems exist with the asbestos mound, groundwater contmination and soil contamination, however, the report does not quantify these problems. The quantification of the suspected contaminated material is essential because it will be instrumental in determining which remedial alternative will be the most cost effective in the feasibility study phase.

C. EPA strongly recommends that additional geologic investigational work be performed to substantiate certain important assumptions that have been stated in the report. This refers to the statement that a confining layer is present under the three satellite sites and that at the Millington Site, groundwater flows into the Passaic River. On the basis of these statements conclusions are made that the contaminants are not migrating to the lower aquifers. EPA recommends that these assumptions be substantiated through additional geologic investigation. The RI report does not attempt to provide a basis for these assumptions which taken from referenced documents.

D. The hydrogeologic discussions of each of the sites is unclear with respect to the characteristics of the water bearing units and their corresponding hydraulic conductivities as described in Section D.2. The report should clarify which wells were used to calculate the values and within which units the wells are screened. It appears that data from wells screening two or more units was considered representative of a single unit. Consequently, the calculated seepage velocities should also be re-evaluated with respect to the above. It is further recommended that the cross-sections for the sites be revised to include the water table and the screened intervals of the wells. These revised cross-sections would better illustrate the problem described above.

E. Regarding the air sampling program, EPA recommends that additional air sampling be done when the asbestos piles are dry. Sampling locations should be in close proximity to the asbestos piles. EPA recommends that the NIOSH 7400 method for air sampling be used. Because a larger volume of air is utilized for this method, EPA feels that a more representative characterization of the airborne contaminants would be obtained.

F. The report format that was presented in this RI groups the main topics for each site into one section. For example, the geology for all the sites is grouped into one section. During our review, the readers found it difficult to examine each site from background to conclusions. The reader has to constantly turn to different sections of the report to gather information on each individual site. It is our recommendation to format the report so that information regarding each site is grouped together in one portion of the report. Each site should essentially be treated as a separate RI. This would make it much easier to read about each site individually.

APPENDIX A

SPLIT SAMPLE COMPARATIVE ANALYSES

ASBESTOS DUMP SITE
ENFORCEMENT OVERSIGHT
ANALYTICAL RESULTS

NOTES FOR TABLES

ND	Not Detected.
R	Spike sample recovery was not within control limits.
B	Value was greater than the instrument detection limit but less than the contract required detection limit.
*	Duplicate analyses not within control limits.
S	Value determined by Method of Standard Addition MBH.
E	Value estimated due to interference.
T	Tentatively Identified Compound.
J	Estimated value.
N	Instrument detection limit used because it was higher than the contract required detection limit.
L	Analyte also found in blank.
REJ	Values rejected.

APPENDIX A

TABLE 1

Split Sample Comparative Analysis:
Potable Well and Groundwater Analytical Results

Sample	Parameter	Concentration (EBASCO)	Concentration (FC HART)
PW-8	Asbestos	ND	<100,000 Fibers/L
PW-10	Metals (ug/l		
	Beryllium	5 R	ND
	Chromium	10	ND
	Copper	17 B	ND
	Silver	19	ND
	Zinc	102	101
	Volatiles (ug/l)		
	Methylene Chloride	3.1 J	9 B
SWP-3 (GS3)	Asbestos	30,000 fibers/cc	120 fibers/cc
	Metals (ug/l)		
	Chromium	21	ND
	Lead	4	ND
	Mercury	6.3	4.7
	Nickel	23	ND
	Zinc	27	33
	Volatiles (ug/l)		
	Trichlorofluoro-methane	217	96
	Semivolatiles		
	Phenol	11	ND

APPENDIX A

TABLE 1 (Cont'd)

Split Sample Comparative Analysis:
Potable Well and Groundwater Analytical Results

Sample	Parameter	Concentration (EBASCO)	Concentration (FC HART)
SWP-5 (GS5)	Asbestos	27,000 fibers/cc	<100 fibers/cc
	Volatiles (ug/l)		
	Trinchlorofluoro-Methane	20	16
	Methylene Chloride	REJ	8 B
	Chlarofarm	REJ	1 JB
	Ethyl Benzene	REJ	0.8 JB
	Semivolatiles (ug/l)		
	Diethylphthalate	3.9	ND
	Di-n-octyl phthalate	ND	16
	Phenol	10	ND
	Metals (ug/l)		
	Beryllium	ND	[3.4]
	Cadmium	ND	24
	Chromiem	13	36
	Copper	26	273 N
	Silver	2.4	ND
	Zinc	148	3.63
NVR-3* (NVR3)	Asbestos	3700 fibers/cc	<100 fibers/cc
	Metals (ug/l)		
	Arsenic	26 R	ND
	Chromium	46	28 P
	Copper	77	25 P
	Lead	28	5.0 RF
	Nickel	48	24
	Zinc	89	57 P
	Semivolatiles	ND	ND
	Pesticides	ND	ND

* Note - Raw Data in F.C. Hart Appendix (Volume II, p. 2093-2096; p. 015) do not aggree with values presented in Table 3-42 (p. 3-42 (p. 3-118 of RI Report).

APPENDIX A

TABLE 2

Split Sample Comparative Analysis:
Surface Water Analytical Results

Sample	Parameter	Concentration (EBASCO)	Concentration (FC HART)
SW-10	Asbestos	120 fibers/cc	200 fibers/cc
	Volatiles (ug/l)		
	Acetone	7.5 J	ND
	Tetrachloroethene	160	ND
	Metals (ug/l)		
	Lead	ND	20
SW-13	Asbestos	1700 fibers/cc	470 fibers/cc
	Volatiles (ug/l)		
	Acetone	7.8	ND
	Tetrachloroethene	95	ND
	Metals (ug/l)		
	Antimony	ND	69
	Cadmium	ND	108
	Chromium	ND	163 N
	Copper	ND	17
	Nickel	ND	68 N
	Zinc	ND	56 N

APPENDIX A

TABLE 3

Split Sample Comparative Analyis:
Sediment Sample Analytical Results

Sample	Parameter	Concentration (EBASCO)	Concentration (FC HART)
SD-7	Volatiles (ug/kg)		
	Methylene Chloride	ND	13 B
	Chloroform	ND	3 J, OB
	Toluene	ND	12 B
	Semivolatiles (mg/kg)		
	Napthalene	1.1	0.75
	Acenapthlene	12	1.4
	Acenaphthene	1.7	1.7
	Fluorene	4.0	6.0
	Phenanthrene	97	37
	Anthrancene	100	5.0
	Fluoranthene	120	35
	Pyrene	2.5	32
	Benzo (a) Anthrancene	39	17
	Chrysene	19	19
	Benzo (b) Fluoranthene	43	21
	Benzo (k) Fluranthene	42	2.9
	Benzo(a) Pyrene	24	13
	Indeno (1,2,3 cd)-Pyrene	9.3	7.0
	Dibenz(a,h)Anthracene	5.7	1.6
	Benzo(g,h,i)Perylene	10.8	8.7
	Total PAHs:	531 pp	209 ppm
	2,4 Dinitrotoluene	2.3	ND
	N-Nitrosodiphenylamine	2.1	ND
	Di-n-butylphthalate	4.1	ND
	Butylbenzylphthalate	1.0	ND
	Metals (ug/l)		
	Arsenic	2.1 B,N	ND
	Beryllium	1.5	ND
	Chromium	18	21
	Copper	43	40
	Lead	75	80 R
	Mercury	0.15	ND
	Nickel	15	17
	Silver	ND	ND
	Zinc	194	84

APPENDIX A

TABLE 3 (Cont'd)

Split Sample Comparative Analysis:
Sediment Sample Analytical Results

Sample	Parameter	Concentration (EBASCO)	Concentration (FC HART)
SD-8	Volatiles (ug/kg)		
	Trichlorofluoromethane	ND	1 J,B
	Chloroform	ND	4 J,B
	Benzene	ND	1 J
	1,1,2,2, Tetra-chloroethane	ND	2 J
	Toluene	ND	4 J,B
	Chlorobenzene	ND	2 J
	Semivolatiles (ug/kg)		
	Di-n-butylphthalate	ND	17 B
	Metals (mg/kg)		
	Beryllium	1.2	ND
	Chromium	20	34
	Copper	13	16
	Lead	8.8	11
	Nickel	13	18
	Zinc	77	40

APPENDIX A

TABLE 4

Split Sample Comparative Analysis:
Soil Sample Analytical Results

Sample	Parameter	Concentration (EBASCO)	Concentration (FC HART)
Boring GSD (6'-8') (GSD-14)	Volatiles (ug/kg)		
	Methylene Chloride	ND	5 J,B
	Trichlorofluoromethane	1000	190
	Chloroform	ND	2 J,B
	Benzene	2	8
	Tetrachloroethene	ND	17
	Toluene	27	43 B
	Chlorobenzene	36	1 J
	Trichloroethene	13	ND
	Semivolatiles (ug/kg)		
	3,3 Dichlorobenzidene	6900 N	ND
	Benzo(b)Fluroanthene	2700 N	ND
	Indeno (1,2,3-cd) Pyrene	3200 N	ND
	Dibenz(a,h)Anthracene	3900 N	ND
	Benzo(g,h,i)Perylene	4200 N	ND
	Di-n-butylphtalate	ND	32 J,B
	Bis-2-ethylhexyl-phthalate	ND	250 J,B
	Metals (mg/kg)		
	Antimony	ND	7.6
	Beryllium	ND	43
	Cadmium	ND	31
	Chromium	47	20 R
	Copper	32	0.45
	Lead	18	66
	Nickel	65	ND
	Silver	ND	66
	Zinc	86	0.34